Citation:

Driscoll TR, Harrison JE, Steenkamp M. Review of the role of alcohol in drowning associated with recreational aquatic activity. *Injury Prevention* 2004;10:107-113.

PubMed ID: 15066977

Study Design:

Systematic Review

Class:

M - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To assess the role of alcohol in drowning associated with recreational aquatic activity by reviewing the English language literature published up to October 2003.

Inclusion Criteria:

- English language literature published up to October 2003 was searched for relevant articles
- Recreational aquatic activities were defined as activities explicitly related to water that are undertaken for fun, pleasure or amateur sport, and including swimming, surfing, boating, water skiing, underwater diving and fishing
- Any relevant setting was included, such as oceans, beaches, rivers, creeks, lakes and public and private swimming pools

Exclusion Criteria:

- Deaths that occurred when the contact with the water was incidental or the activity was not recreational were excluded

Description of Study Protocol:

Recruitment

- English language literature published up to October 2003 was searched for relevant articles
- The main keywords used were "drown", "drowning", "immersion", "alcohol", "drink", and "drinking"
- Initial searches were through PubMed and the library of the Research Centre for Injury Studies
- Secondary follow-up of sources cited in reference lists of obtained papers also provided a number of appropriate papers

Design: Systematic review

Blinding used (if applicable): not applicable

Intervention (if applicable): not applicable

Statistical Analysis: not completed

Data Collection Summary:

Timing of Measurements

Not applicable.

Dependent Variables

- Drowning associated with recreational aquatic activity

Independent Variables

- Alcohol consumption

Control Variables

None mentioned

Description of Actual Data Sample:

Initial N: 65 references included, original number of articles identified not described

Attrition (final N): 65 references

- 10 studies regarding alcohol involvement in deaths arising from recreational swimming
- 13 studies regarding alcohol involvement in deaths arising from recreational boating
- 5 published estimates of risk or relative risk of fatal injury in relation to recreational aquatic activities

Age: not described

Ethnicity: not described

Other relevant demographics:

Anthropometrics

Location: International studies, but most published in the United States

Summary of Results:

Key Findings

- Alcohol is widely used in association with recreational aquatic activity in the United States,

but there is minimal information regarding the extent of use elsewhere
- Surveys have consistently stated that about 30% - 40% of people on boats drink alcohol while on board, that men tend to drink more and behave in higher risk aquatic activities in association with drinking than women, and that available boater training is inadequate.
- A priori and anecdotal evidence suggests that alcohol is an important risk factor for drowning associated with recreational aquatic activity
- Specific studies provide good evidence supporting this, but the extent of increased risk associated with alcohol use, and the attributable risk due to alcohol use, is not well characterized
- Drowning appears to be the overwhelming cause of death associated with recreational aquatic activity with alcohol detected in the blood of 30 - 70% of persons who drown while involved in this activity
- The few relevant studies on degree of increased risk suggest persons with a blood alcohol level of 0.10 g/100 ml have about 10 times the risk of death associated with recreational boating compared with persons who have not been drinking, but that even small amounts of alcohol can increase this risk
- The risk of drowning increases with increasing blood concentration
- Alcohol probably contributes to between 10% and 30% of all recreational drowning deaths

Author Conclusion:

Alcohol appears to be widely used in association with recreational aquatic activity, and to be an important risk factor for drowning associated with recreational aquatic activity. Information is lacking in many areas concerning alcohol use in relation to recreational aquatic activity. The most important of these relate to understanding the attitudes and alcohol use of persons engaging in recreational aquatic activity, characterizing the increased risk (and the attributable risk due to alcohol) of drowning that arises from different levels and types of alcohol use, and evaluating the many prevention approaches that have been suggested or already implemented.

Reviewer Comments:

Authors note that the overall quality of the studies, and in particular their usefulness in the current consideration of drowning in recreational aquatic activities, varied considerably. In addition, most of the studies had a significant minority or even a majority of cases with missing blood alcohol values.

- *Difficult to measure due to timing of blood alcohol testing*
- *A key consideration is whether alcohol relatedness/involvement refers solely to the presence of alcohol, or whether alcohol contributed to or caused the injury event because of impairment of relevant parties*
- *Confounding factors, such as polydrug use, how learned the activity is, hangover effects, and psychophysiological consequences, complicate the relationship between intoxication and impairment*

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions

1.	Will the answer if true, have a direct bearing on the health of patients?	Yes
2.	Is the outcome or topic something that patients/clients/population groups would care about?	Yes
3.	Is the problem addressed in the review one that is relevant to nutrition or dietetics practice?	Yes
4.	Will the information, if true, require a change in practice?	Yes

Validity Questions

1.	Was the question for the review clearly focused and appropriate?	Yes
2.	Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search termsused described?	Yes
3.	Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?	???
4.	Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?	No
5.	Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?	No
6.	Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	Yes
7.	Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issued considered? If data from studies were aggregated for meta-analysis, was the procedure described?	No
8.	Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes
10.	Was bias due to the review's funding or sponsorship unlikely?	Yes